I CLAIM:

1. An autonomous apparatus for harvesting atmospheric moisture, said apparatus comprising:

an energy-gathering member and a first condensation member, said energy-gathering member being spaced from said first condensation member so as to define a first air passageway between said energy-gathering member and said first condensation member through which atmospheric air can flow, said first condensation member having a first condensation surface facing said first air passageway and on which atmospheric moisture is condensed; and

a cooling system disposed so as to cool said first air passageway and/or said first condensation surface by an amount sufficient to cause moisture within atmospheric air flowing through said first air passageway to condense and collect on said first condensation surface;

wherein said energy-gathering member gathers energy and provides electrical power to operate said cooling system.

2. The apparatus of claim 1, further comprising frame members which hold said energy-gathering member and said first condensation member in spaced relationship.

3. The apparatus of claim 1, wherein said energy-gathering member comprises photovoltaic cells.

4. The apparatus of claim 1, further comprising a second condensation member spaced from said first condensation member to form a second air passageway, said second condensation member having a second condensation surface facing said second air passageway.

5. The apparatus of claim 4, wherein said cooling system is further disposed so as to cool said second air passageway and/or said second condensation surface by an amount sufficient to cause moisture within atmospheric air flowing through said second air passageway to condense and collect on said second condensation surface.

6. The apparatus of claim 1, wherein said cooling system comprises a conventional gas- or gas/liquid-phase refrigeration system.

7. The apparatus of claim 1, wherein said cooling system comprises cooling coils that are spaced from said first condensation surface and that are disposed within said first air passageway to cool said air passageway.

8. The apparatus of claim 1, wherein said cooling system comprises cooling channels that are embedded within said first condensation member and that cool said first condensation surface from within said first condensation member.

9. The apparatus of claim 1, wherein said first condensation surface comprises hydrophilic material.

10. The apparatus of claim 1, wherein said first condensation surface has dendritic channels formed therein to facilitate the flow of condensed and coalesced water along said first condensation member.

11. The apparatus of claim 10, wherein said dendritic channels are lined with hydrophobic material to facilitate the flow of water along said dendritic channels.

12. The apparatus of claim 1, wherein said cooling system comprises solid state heat pumps consisting of thermoelectric cooling devices.

13. The apparatus of claim 1, wherein said cooling system comprises a thermoacoustic heat pump and micro-channel refrigerant channels.

14. The apparatus of claim 1, wherein said cooling system comprises magnetocaloric chillers and heat exchangers.

15. The apparatus of claim 1, further comprising an energy storage device which stores electrical energy provided by said energy-gathering member that is in excess of the amount of electrical power required to operate said cooling system.

16. The apparatus of claim 15, wherein said energy storage device is a rechargeable battery or fuel cell.

17. The apparatus of claim 15, wherein said energy storage device is a capacitor.

18. The apparatus of claim 1, wherein said apparatus is configured to be disposed in a tilted orientation and said first condensation member has a water catchment member at a lower end thereof to catch condensed and coalesced water running down along said first condensation surface.

19. The apparatus of claim 18, wherein said energy-gathering member has a rain catchment member at a lower end thereof to catch rain falling onto and running down along an upper surface of said energy-gathering member.

20. The apparatus of claim 1, further comprising an air thruster arranged to propel air through said first air passageway.

21. An atmospheric moisture-harvesting array, said array comprising:

a plurality of interconnected atmospheric moisture-harvesting apparatuses, each of said atmospheric moisture-harvesting apparatuses comprising

an energy-gathering member and a condensation member, said energy-gathering member being spaced from said condensation member so as to define an air passageway between said energy-gathering member and said condensation member through which atmospheric air can flow, said condensation member having a condensation surface facing said air passageway and on which atmospheric moisture is condensed; and

a cooling system disposed so as to cool said air passageway and/or said first condensation surface by an amount sufficient to cause moisture within atmospheric air flowing through said air passageway to condense and collect on said condensation surface;

said energy-gathering member gathering energy and providing electrical power to operate said cooling system.

22. The array of claim 21, further comprising a common or centralized refrigeration system which supplies refrigerant to the cooling system of each moisture-harvesting apparatus in said array.

23. The array of claim 21, further comprising a common or centralized electrical system, the energy-gathering member of each moisture-harvesting apparatus in said array providing electrical energy to said common or centralized electrical system.

24. The array of claim 21, wherein said moisture-harvesting apparatuses are disposed on a roof of a building.

25. The array of claim 21, wherein said moisture-harvesting apparatuses form a roof of a building.

26. A method of providing water, said method comprising:

passing moisture-laden atmospheric air through an air passageway and over a condensation surface of a condensation member, said air passageway being formed between said condensation member and an energy-gathering member and said air passageway and/or said condensation surface being chilled by means of a cooling system, whereby moisture in said atmospheric air is caused to condense and gather on said condensation surface; and

collecting said condensed and gathered water;

wherein said cooling system is powered by means of electricity produced by said energy-gathering member.

27. The method of claim 26, further comprising collecting rainwater which falls on said energy-gathering member.

28. The method of claim 26, wherein more energy is produced by said energy-gathering member than is needed to power said cooling system, said method further comprising storing excess energy in an energy storage means.

29. The method of claim 28, further comprising powering said cooling system using energy stored in said energy storage means during periods in which said energy-gathering member does not produce energy.

30. The method of claim 26, wherein said moisture-laden atmospheric air flows naturally through said air passageway due to density differences between cooled air within said air passageway and ambient moisture-laden air.

31. The method of claim 26, further comprising actively conducting said moisture-laden air through said air passageway using an air thruster or blower assembly.

32. An autonomous apparatus for harvesting atmospheric moisture, said apparatus comprising:

a case with one or more chillable condensation panels disposed therein, said one or more condensation panels forming one or more air passageways therebetween and/or between one of said one or more condensation panels and a wall of said case;

refrigeration apparatus which operates to chill said one or more condensation panels;

an opening formed in said case through which air can flow into said case;

an exhaust port through which air that has flowed into said case can exit said case after having passed through said one or more air passageways;

a water collector configured and disposed so as to collect water that has condensed on and flowed down along said one or more condensation panels; and

an energy-gathering member which gathers and provides energy to power said refrigeration apparatus.

33. The apparatus of claim 32, wherein said energy-gathering member comprises one or more photovoltaic panels.

34. The apparatus of claim 33, wherein said one or more photovoltaic panels is or are attached to said case.

35. The apparatus of claim 34, wherein said one or more photovoltaic panels is or are attached to said case by hinge members, thus allowing said one or more photovoltaic panels to be opened from a storage position to an open, operational position.

36. The apparatus of claim 33, wherein said one or more photovoltaic panels is or are separate from said case but is or are operatively connected to said refrigeration apparatus to provide power thereto.

37. The apparatus of claim 32, further comprising one or more fans that are located and positioned to cause air to flow into said case through said opening, through said one or more air passageways, and out of said case via said exhaust port.

38. The apparatus of claim 32, further comprising an air diffuser which is positioned to distribute air flowing into said case via said opening among said one or more air passageways.

39. The apparatus of claim 32, further comprising electrical and control systems.

40. The apparatus of claim 39, wherein said electrical and control systems comprise power outlet sockets by means of which excess power produced by said energy-gathering member can be transferred to excess-energy storage means.

41. The apparatus of claim 39, wherein said electrical and control systems comprise power inlet sockets by means of which supplemental power can be provided to power said refrigeration apparatus.

42. The apparatus of claim 32, further comprising adjustable leg members to permit deployment of said apparatus in a variety of locations and under a variety of topographical conditions.